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EXAMINER	
KOCA, HUSEYIN	

ART UNIT	PAPER NUMBER
3744	

MAIL DATE	DELIVERY MODE
08/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/730,492	PHAM ET AL.	
	Examiner	Art Unit	
	Huseyin Koca	3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 April 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-69* is/are pending in the application.

4a) Of the above claim(s) *1-35 and 39* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *35-38, 40-44, and 47-67* is/are rejected.

7)☒ Claim(s) *45 and 46* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 35, 37, 42-43, 48 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa et al. (4,506,518) in view of Nagatomo et al. (4,494,383) and in further view of Jaster (5,435,145).

In regard to claims 35, 37, 42-43, 48 and 50, Yoshikawa et al. disclose the invention substantially as claimed. Yoshikawa et al. disclose a refrigeration system having a condenser (3), compressor (2), load sensor (43), liquid-side expansion valve (28) operated by a stepper motor and controller (49 and 50) responsive to the load sensor for modulating both the compressor capacity and the expansion valve opening in order to provide the proper level of refrigeration (Fig. 1). Yoshikawa et al. also shows that the compressor and the valve are operated with the same signals (Table 1 -

Compressor: X1 and Valve: Z1, Compressor: X2 and Valve: Z2, Compressor: X3 and Valve: X3; C-10, L-35-58). Yoshikawa et al. do not explicitly teach the use of a pulse width modulated variable capacity in order to provide adjustable compressor capacity for a refrigeration system. Nagatomo et al. teach the use of a pulse width modulated variable capacity in order to provide adjustable compressor capacity for a refrigeration system (C-3, L-20-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the system of Yoshikawa et al. such that it included the use of a pulse width modulated variable capacity compressor to provide the adjustable compressor capacity rather than the variable speed compressor in view of the teachings of Nagatomo et al.. Yoshikawa et al. in view of Nagatomo et al. do not explicitly teach applying the variable duty cycle control signal to both a compressor and valve of the system. Jaster teaches a refrigerant flow rate control system with a compressor 12 wherein the variable duty cycle is operated for both the compressor and valve. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yoshikawa et al. in view of Nagatomo et al. with control system of Jaster in order to conserve overall energy expenditure of the system because one of ordinary skill in the art at the time of the invention would have known that operating the compressor and valve in one duty cycle together is more efficient than operating the compressor and valve using a duty cycle separately. In a duty cycle control system that the duty cycle time period will be shorter than the time constant of the load in order for the control system to work properly.

4. Claim 49 rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa et al. (4,506,518) in view of Nagatomo et al. (4,494,383) and Jaster (5,435,145) as applied to claim 35 above, and further in view of Alsenz (5,035,119).

In regard to claim 49, Yoshikawa et al. in view of Nagatomo et al. and Jaster teach all limitations of claim 35 however fail to explicitly teach a pulsing solenoid valve. Alsenz teaches the use of pulsing a solenoid to operate an expansion valve. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the system of Yoshikawa such that it included the use of pulsing a solenoid to operate the expansion valve in order to vary the pressure and flow rate at which the refrigerant flows through the system according to system requirements instead of one steady pressure and flow rate, and thus increase system efficiency and conserve energy expenditure.

5. Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa et al. (4,506,518) in view of Nagatomo et al. (4,494,383) and Jaster (5,435,145) as applied to claim 35 above, and further in view of Takizawa et al. (4,962,648).

In regard to claim 47, Yoshikawa et al. in view of Nagatomo et al. and Jaster teach all limitations of claim 35 however fail to explicitly teach the use of a suction-side pressure regulator. Takizawa et al. teach the use of suction-side pressure regulator 14 in order to provide the proper level of refrigeration. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the system of Yoshikawa et al. such that it included use of a suction-side pressure regulator 14 in

order to provide the proper pressure adjustment, and thus adjust the system compressor speed as one of ordinary skill in the art at the time the invention was made would have known compressor speed and suction side pressure of the refrigerant are related to system efficiency.

6. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa et al. (4,506,518) in view of Nagatomo et al. (4,494,383) and Jaster (5,435,145) as applied to claim 35 above, and further in view of Tanaka (4,634,046).

In regard to claim 44, Yoshikawa et al. in view of Nagatomo et al. and Jaster teach all limitations of claim 35 however fail to explicitly teach the use of capacity control in which cooling capacity is varied between hundred percent and zero percent. Tanaka teaches the used of capacity control in which cooling capacity is varied between hundred percent and zero percent. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the system of Yoshikawa such that it included the use of capacity control in which cooling capacity is varied between hundred percent and zero percent to advantageously ensure cooling is done at one hundred percent capacity until needed and then stopped. This conserves energy expenditure, as the system will only operate when needed and not provide cooling capacity in the intermediate capacity ranges continuously even when cooling is not necessary.

7. Claims 36, 38, 40, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa et al. (4,506,518) in view of Nagatomo et al. (4,494,383)

and Jaster (5,435,145) as applied to claim 35 above, further in view of Bendtsen (5,396,780).

In regard to claims 36, 38, 40 and 41, Yoshikawa et al. in view of Nagatomo et al. and Jaster teach all limitations of claim 35 however fail to explicitly teach the use of both temperature and pressure sensors for control of the capacity of a cooling system. Bendtsen teaches the use of both temperature 8 and pressure 11 sensors for control of the capacity of a cooling system. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the system of Yoshikawa such that it included such that it included the use of both temperature and pressure sensors for control of the capacity of the cooling system as it is well known in the art temperature and pressure sensors are directly related to the cooling performance of a refrigeration system. It is inherent that various parameters of a refrigeration system will have different rates of change.

8. Claims 51-53, 56-57, 59, 61-62 and 65-67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa et al. (4,506,518) in view of Nagatomo et al. (4,494,383) and Jaster (5,435,145) as applied to claim 35 above, and further in view of Schaeffer et al. (5,440,894).

In regard to claims 51-53, 56-57, 59, 61-62 and 65-67, Yoshikawa et al. in view of Nagatomo et al. and Jaster teach most of the limitations of the claim but do not explicitly teach cooling multiple refrigeration cases. Schaeffer et al. teach the use of a refrigeration system for cooling multiple refrigeration cases and the use of scroll compressors in refrigeration systems. It would have been obvious to one of ordinary

skill in the art at the time the invention was made to have modified the system of Yoshikawa such that it included the use of a refrigeration system to cool multiple refrigeration cases to be advantageously provide cooling for multiple cases from a central location rather than provide cooling to each individual case separately, thus increasing system efficiency. With respect to claim 66 it would have been obvious to one of ordinary skill in the art to use a scroll compressor as it is was well known in the art at the time the invention was made scroll compressors are more efficient and have better part load performance than reciprocating compressors.

In regard to claims 54-55, 60, 63-64, see claims 36, 38, 40 and 41.

In regard to claim 58, see claim 44.

Allowable Subject Matter

9. Claims 45 and 46 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

10. Applicant's arguments filed 04/25/2007 have been fully considered but they are not persuasive.

Summary of Arguments

1. Applicant argues the rejection under 35 U.S.C. 103(a) under Yoshikawa et al. (4,506,518) in view of Nagatomo et al. (4,494,383) and in further view of Jaster (5,435,145) regards to claim 35 as Jaster fails to teach or suggest using the same pulse width modulated control signal to control both a compressor and a valve.

2. Applicant argues the rejection under 35 U.S.C. 103(a) under Yoshikawa et al. (4,506,518) in view of Nagatomo et al. (4,494,383) and Jaster (5,435,145), and further in view of Schaeffer et al. (5,440,894) regards to claim 51 as Jaster fails to teach or suggest using the same pulse width modulated control signal to control both a compressor and a valve.

Response to Arguments

1. The arguments for the rejection under 35 U.S.C. 103(a) under Yoshikawa et al. (4,506,518) in view of Nagatomo et al. (4,494,383) and in further view of Jaster (5,435,145) regards to claim 35 is not persuasive. Argument made by the applicant is an argument for the rejection under 35 U.S.C. 102. Nagatomo et al. teach the use of a pulse width modulated variable capacity in order to provide adjustable compressor capacity for a refrigeration system. Yoshikawa et al. in view of Nagatomo et al. do not explicitly teach applying the variable duty cycle control signal to both a compressor and valve of the system. Jaster teaches a refrigerant flow rate control system with a compressor 12 wherein the variable duty cycle is operated for both the compressor and valve. Therefore, the prior art reference Yoshikawa et al., Nagatomo et al., and Jaster

create a prime facie case of obviousness to one of ordinary skill in the art at the time of the invention. Jaster teaches a Thus the rejection of claim 35 and all depending claims is proper and remains.

2. The arguments for the rejection under 35 U.S.C. 103(a) under Yoshikawa et al. (4,506,518) in view of Nagatomo et al. (4,494,383) and in further view of Jaster (5,435,145) regards to claim 51 is not persuasive. Argument made by the applicant is an argument for the rejection under 35 U.S.C. 102. The prior art reference Yoshikawa et al., Nagatomo et al., Jaster, and Schaeffer et al. create a prime facie case of obviousness to one of ordinary skill in the art at the time of the invention. Thus the rejection of claim 51 and all depending claims is proper and remains.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huseyin Koca whose telephone number is (571) 272-3048. The examiner can normally be reached on Monday - Friday 9:00AM to 4:00PM.

13. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571) 272-4834 or Frantz Jules (571) 272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HK/

FRANTZ JULES
SUPERVISORY PATENT EXAMINER